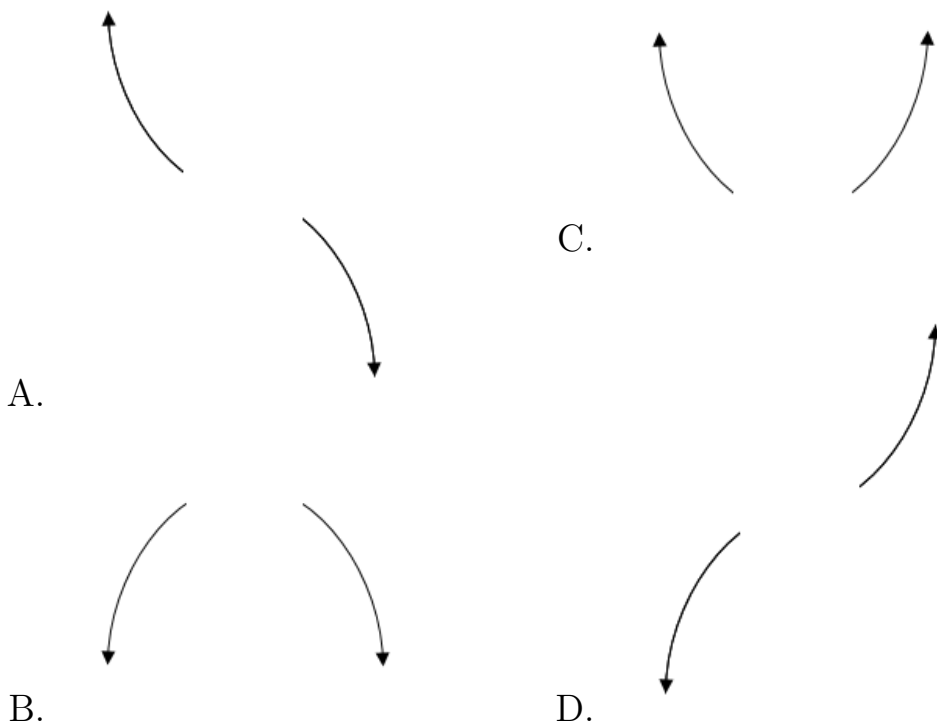1. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.

$$\frac{-3}{4}, \frac{7}{4}, \text{ and } \frac{1}{5}$$

A. $a \in [71, 88], b \in [-99, -95], c \in [-89, -81],$ and $d \in [-25, -15]$

B. $a \in [71, 88], b \in [-222, -215], c \in [143, 147],$ and $d \in [-25, -15]$

C. $a \in [71, 88], b \in [-99, -95], c \in [-89, -81],$ and $d \in [16, 31]$

D. $a \in [71, 88], b \in [57, 67], c \in [-121, -119],$ and $d \in [16, 31]$

E. $a \in [71, 88], b \in [94, 102], c \in [-89, -81],$ and $d \in [-25, -15]$

2. Describe the end behavior of the polynomial below.

$$f(x) = 7(x - 7)^4(x + 7)^7(x - 3)^2(x + 3)^2$$


C.

A.

B.   D.

E. None of the above.

3. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $x^3 + bx^2 + cx + d$.

$$5 - 4i \text{ and } -4$$

A. $b \in [3, 20], c \in [-0.68, 1.9],$ and $d \in [-168, -161]$

B. $b \in [-1, 4], c \in [5.04, 8.21],$ and $d \in [16, 23]$

C. $b \in [-6, -4], c \in [-0.68, 1.9],$ and $d \in [164, 166]$

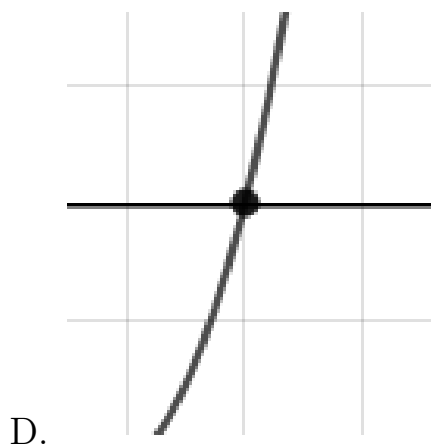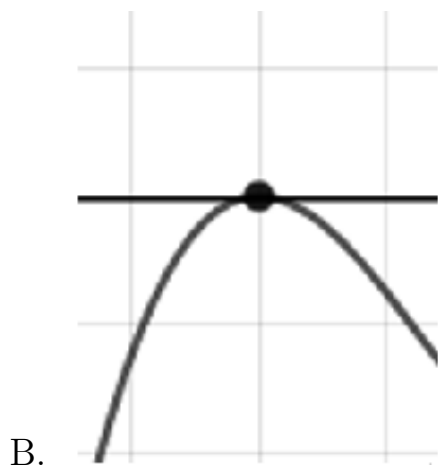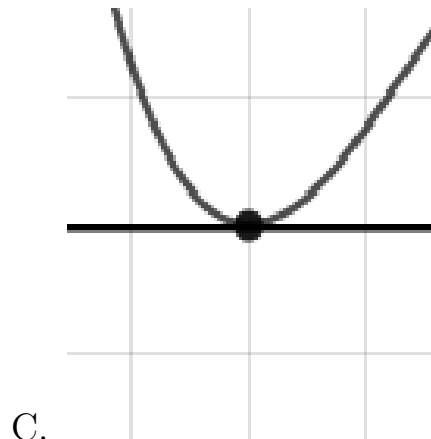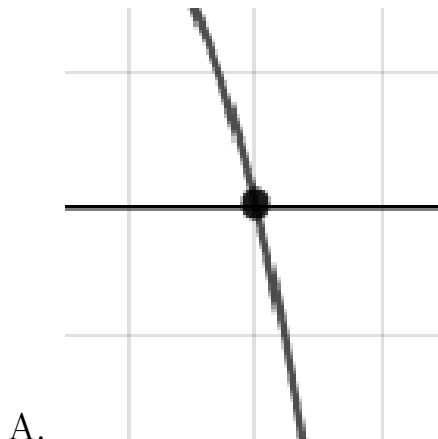D. $b \in [-1, 4], c \in [-1.45, 0.42],$ and $d \in [-20, -17]$

E. None of the above.

4. Which of the following equations *could* be of the graph presented below?
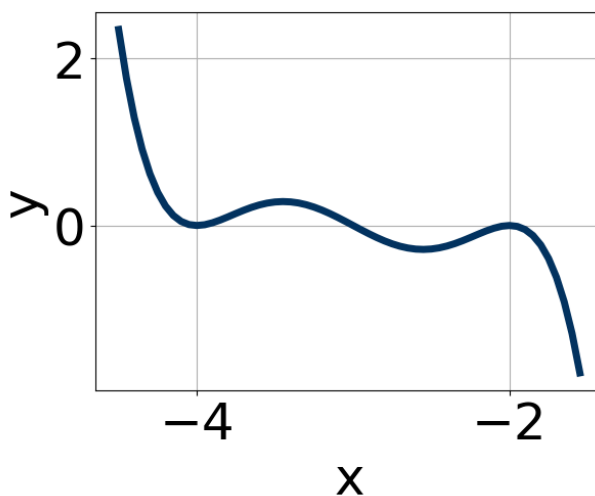
A. $-13(x + 2)^{10}(x + 4)^7(x + 3)^6$

B. $18(x + 2)^{10}(x + 4)^6(x + 3)^{10}$

C. $16(x + 2)^4(x + 4)^4(x + 3)^5$

D. $-6(x + 2)^{10}(x + 4)^6(x + 3)^5$

E. $-15(x + 2)^6(x + 4)^7(x + 3)^{11}$

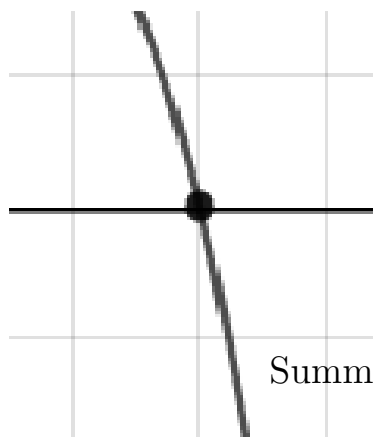5. Describe the zero behavior of the zero $x = -8$ of the polynomial below.

$$f(x) = 6(x+7)^3(x-7)^2(x-8)^5(x+8)^4$$

A.

C.

B.

D.

E. None of the above.

6. Describe the zero behavior of the zero $x = -9$ of the polynomial below.
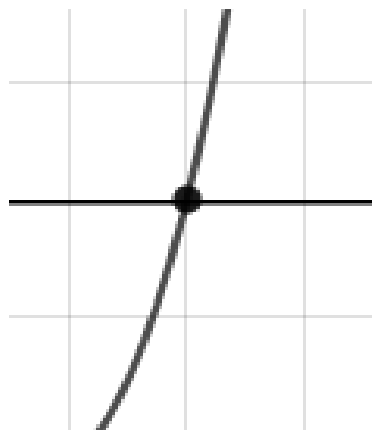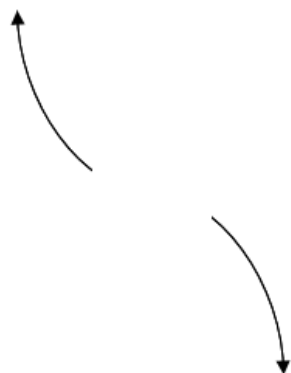
$$f(x) = -2(x+9)^6(x-9)^9(x-8)^2(x+8)^5$$
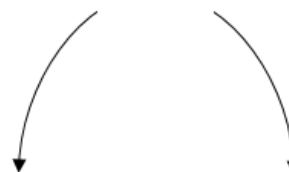
A.

B.

C.

D.

E. None of the above.

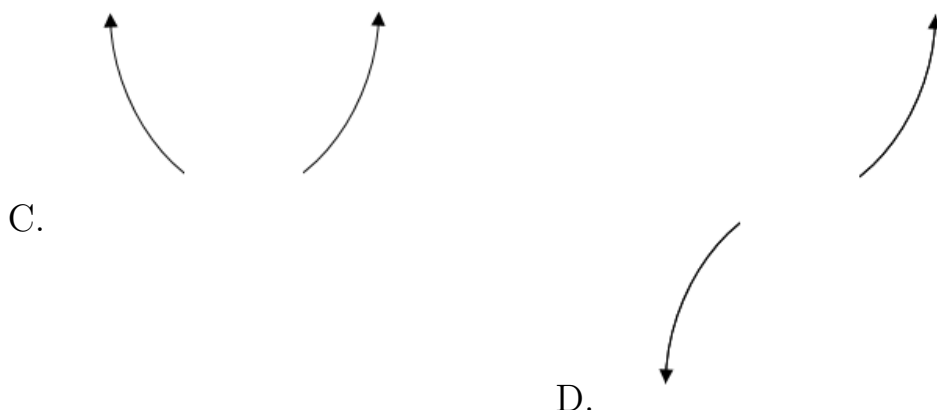7. Describe the end behavior of the polynomial below.

$$f(x) = -4(x-2)^3(x+2)^4(x-9)^5(x+9)^5$$

B.

A.

C.

D.

E. None of the above.

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8. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $x^3 + bx^2 + cx + d$.

$$-3 + 2i \text{ and } 1$$

A. $b \in [-6.2, -2.7], c \in [7, 14],$ and $d \in [10, 14]$

B. $b \in [1.3, 5.6], c \in [7, 14],$ and $d \in [-16, -7]$

C. $b \in [-0.3, 3.3], c \in [-2, 3],$ and $d \in [-5, 0]$

D. $b \in [-0.3, 3.3], c \in [-6, -1],$ and $d \in [0, 3]$

E. None of the above.

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9. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.
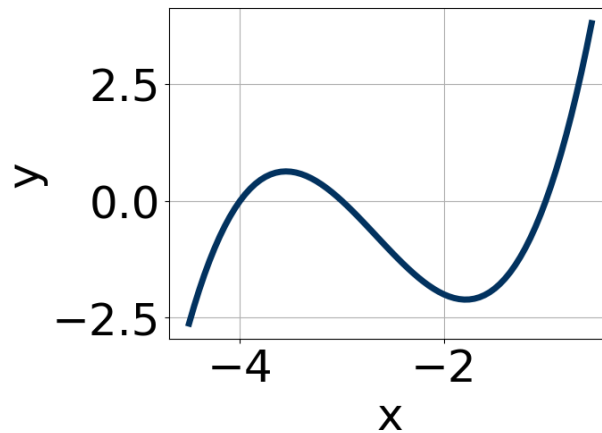
$$\frac{-5}{4}, \frac{-3}{4}, \text{ and } 5$$

A. $a \in [15, 19], b \in [42, 52], c \in [-151, -140],$ and $d \in [68, 80]$

B. $a \in [15, 19], b \in [-48, -41], c \in [-151, -140],$ and $d \in [68, 80]$

C. $a \in [15, 19], b \in [-48, -41], c \in [-151, -140],$ and $d \in [-76, -69]$

D. $a \in [15, 19], b \in [-94, -79], c \in [23, 34],$ and $d \in [68, 80]$

E. $a \in [15, 19], b \in [-119, -111], c \in [173, 179],$ and $d \in [-76, -69]$

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10. Which of the following equations *could* be of the graph presented below?

A. $5(x + 1)^8(x + 3)^4(x + 4)^5$

B. $-17(x + 1)^4(x + 3)^5(x + 4)^5$

C. $10(x + 1)^{11}(x + 3)^7(x + 4)^{11}$

D. $5(x + 1)^4(x + 3)^{11}(x + 4)^{11}$

E. $-9(x + 1)^7(x + 3)^{11}(x + 4)^9$